Chemical Terrorism: Medical Countermeasures

Developing an NIH Research Agenda

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Threat Agents of Concern

- Toxic Industrial Chemicals (TICs) - cyanide, ammonia, etc.
- Blister agents – sulfur mustard
- Nerve Agents - sarin, soman, tabun, VX
- Choking agents – phosgene, chlorine
- Plant toxins - ricin
- Aquatic toxins - brevetoxin, ciguratoxin, microcystin
- Fungal toxins - aflatoxin, mycotoxins
- Animal toxins - tetrodotoxin, saxitoxin, snake, frog, other venoms

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Federal Agency Responsibilities

Currently no federally-sponsored research program focused on development of medical countermeasures to be used in civilian populations following a chemical attack.

- CDC/NIOSH – Improving personal protection (masks & respirators)
- CDC & ATSDR# – New laboratory tests/assays, investigation of incidents with suspected chemical releases
- FDA & USDA – Investigating ways to detect and measure toxic substances in foods

Agency for Toxic Substances and Disease Registry

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FY ’06 Objectives

- Develop and implement an NIH Research Strategic Plan on medical countermeasures against chemical agents
- Hold a number of workshops in FY ’05 (underway) to determine needs (cyanide, anticonvulsants, pulmonary edema)
- Develop a number of new initiatives
- NIAID, NIEHS, NINDS, NHLBI are major participants
- Anticipate approximately $50 M commitment on behalf of DHHS for this effort

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Goals of Program

Product development and deployment for civilians is the goal

- Establish Medical Research Centers for Chemical Countermeasures – Include researchers from academia, industry, and government.
  - host response and repair
  - mechanisms of chemical injury
  - acute and chronic effects
  - diagnostics, biomarkers
  - therapeutics
  - protectants
  - health effects of low-level exposure

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Goals of Program (cont.)

- FDA-approved Drugs – Expand indications for use against chemical threat agents (e.g., anti-seizure drugs and neuroprotectants).
- Civilian application of military products – Develop Interagency Agreement with U.S. Army and USAMRICD to address product development needs.

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NIEHS Intra- and Extramural Expertise

- Basic biological research
- Toxicology
- Health effects (mechanisms)
- Epidemiology
- Risk assessment
- Remediation
- Training (including worker training)
- Community involvement and outreach

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NIEHS Research Can Contribute:

- Environmental monitoring
  - Real time detectors and sensors
- Cleanup/Remediation
  - Immediate response using chemical or physical methods
  - Sustained response using biodegradation technologies
- Environmental transport and fate of contaminants
- Health effects
- Prevention and treatment strategies
- Worker training, first responders
- Community outreach

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